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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,806	04/20/2001	Marc Schneiderman	8738/1	3517

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SHAH, NILESH R

ART UNIT	PAPER NUMBER
2195	

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 August 2005*.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21,25,26,28-34 and 38-52* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21,25,26,28-34 and 38-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1. Claims 1-21,25,26,28-34 and 38-52 are presented for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth
> in section 102 of this title, if the differences between the subject matter sought to be patented and the
> prior art are such that the subject matter as a whole would have been obvious at the time the invention
> was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability
> shall not be negatived by the manner in which the invention was made.

3. Claims 1-21,25,26,28-34 and 38-52 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Obana (US 2001/0016911) view of Jagannathan et al (6,496,871)

(hereinafter Jagannathan)

4. As per claim 1, Obana teaches a method for providing parallel execution of computing

tasks in a heterogeneous computing environment having a plurality of computing hosts

comprising: partitioning a computing task into small tasks (abstract; 0058; 0093).

5. Obana does not specifically teach the use of mobile agents.

Jagannathan teaches assigning the small tasks to mobile agents determining available

computing hosts in the heterogeneous computing environment automatically transferring

said mobile agents to determined available computing hosts responsive to a detected

indication that migration needs to be initiated (col. 2 lines 59-67; col. 5 lines 57-67; col. 6

lines 1-19; col. 24 lines 1-40);

monitoring the computing hosts for detecting an indication that migration needs to be

initiated (col. 15 lines 25-50; col. 16 lines 50-64);

executing the mobile agents at the available computing hosts using execution code

provided to the mobile agent from a central serve (col. 6 lines 61-67; col. 10 lines 47-64;

col. 9 lines 1-12); and

maintaining, at a second computer host at which none of said mobile agents are

executing, stack trace and state information about each of said mobile agents to allow one

or more of said mobile agents to be reconstructed in an alternate computer host using said

stack trace and state information (col. 1 lines 9-15; col. 6 lines 33-45; col. 9 lines 1-11;

col. 17 lines 1-14; col. 15 lines 35-60; col. 24 lines 22-64).

6. It would have been obvious to one skilled in the art at the time of the invention to

combine the teachings of Jagannathan and Obana because Jagannathan's system of

including mobile agents to distribute tasks through mobile agents would improve

Obana's system by enhancing network mobility and communication.

7. As per claim 2, Jagannathan teaches a method wherein said indication comprises an

indication of network latency (col. 23 lines 25-57).

8. As per claim 3, Jagannathan teaches a method further comprising transferring execution

code from a central server to virtual machines at the available computing hosts (60, fig 5;

col. 12 lines 40 –63).

9. As per claim 4, Jagannathan teaches a method wherein the step of executing the mobile agents is performed in virtual machines at the computing hosts without modification of the virtual machines (col. 6 lines 61-67; col. 10 lines 47-64; col. 9 lines 1-12).

10. As per claim 5, Jagannathan teaches a method wherein one of the small tasks is assigned to one of the mobile agents (col. 24 lines 25-37; col. 26 lines 27-44).

11. As per claim 6, Jagannathan teaches a method wherein the step of transferring execution code is performed in response to a request by a mobile agent (col. 10 lines 47-64; col. 9 lines 1-12).

12. As per claim 7, Jagannathan teaches a method wherein the step of transferring execution code is performed by a web server (col. 23 lines 25-57).

13. As per claim 8, Jagannathan teaches a method further comprising monitoring execution of the mobile agents at the available computing hosts (col. 1 lines 9-15; col. 6 lines 33-45; col. 9 lines 1-11; col. 17 lines 1-14; col. 24 lines 22-64).

14. As per claim 9, Jagannathan teaches a method further comprising allowing the mobile agents to collaborate over the heterogeneous computing environment as the mobile agents execute at the available computing hosts (col. 9 lines 1-11; col. 17 lines 1-14; col. 24 lines 22-64).

15. As per claim 10, Jagannathan teaches a method wherein the mobile agents are executed

in real time (col. 9 lines 32-41).

16. Claim 11 is rejected based on the same rejection for claim 1 above. In addition

Jagannathan teaches storing stack trace and real-time state information about one or more

the mobile agents at a first alternate computing host on which none of the one or more

mobile agents are executing to allow the one or more mobile agents to be reconstructed at

a second alternate computing host (col. 1 lines 9-15; col. 6 lines 33-45; col. 9 lines 1-11;

col. 17 lines 1-14; col. 24 lines 22-64).

17. As per claim 12, Jagannathan teaches a method further comprising, prior to transferring

the mobile agents, the steps of:

halting transferring of the mobile agents if network latency exceeds a threshold (col. 23

lines 25-57).

18. As per claim 13, Jagannathan teaches a method further comprising, prior to transferring

the mobile agents, if utilization of computing hosts fails to exceeds a predetermined

threshold (col. 23 lines 25-57).

19. As per claim 14, Obana method for providing parallel computing comprising:

breaking a computer task into small tasks(abstract; 0058; 0093).

Jagannathan teaches constructing an application using a plurality of mobile agents (col. 9

lines 1-11; col. 17 lines 1-14; col. 24 lines 22-64);

transferring the plurality of mobile agents to a first computing host (col. 2 lines 59-67;

col. 5 lines 57-67; col. 6 lines 1-19);

executing the plurality of mobile agents at the first computing host (col. 6 lines 61-67;

col. 10 lines 47-64; col. 9 lines 1-12);

maintaining, stack trace and state information about each of the mobile agents at a second

computing host on which none of the plurality of mobile agents are executing (col. 1

lines 9-15; col. 6 lines 33-45; col. 9 lines 1-11; col. 17 lines 1-14; col. 24 lines 22-64).

migrating an application in a virtual machine from a primary host to a secondary host

(col. 12 lines 27-39); and

detecting an indication to migrate the application, wherein said indication comprises one

of the group consisting of network latency, hostile attack, hacking, network failure or

computer hardware failure (col. 23 lines 25-57) in response to a detected indication,

automatically migrating the application from primary host to the secondary host without

modifying a virtual machine (col. 1 lines 9-15; col. 6 lines 33-45; col. 9 lines 1-11; col.

17 lines 1-14; col. 24 lines 22-64).

20. As per claim 15, Jagannathan teaches a method wherein said step of determining

available computing hosts is performed in real time (col. 23 lines 25-57; col. 17 lines 1-

14; col. 24 lines 22-64).

21. As per claim 16, Jagannathan teaches a method the indication comprises an indication of hostile attack (col. 23 lines 25-57).

22. As per claim 17, Jagannathan teaches a method wherein the hostile attack comprises hacking (col. 23 lines 25-57).

23. As per claim 18, Jagannathan teaches a method wherein the indication comprises an indication of network failure (col. 23 lines 25-57).

24. As per claim 19, Jagannathan teaches a method the indication comprises an indication of computer hardware failure (col. 23 lines 25-57).

25. As per claim 20, Jagannathan teaches a method further comprising resuming execution of the mobile agent at the secondary host where execution was halted (col. 1 lines 9-15; col. 6 lines 33-45; col. 9 lines 1-11; col. 17 lines 1-14; col. 24 lines 22-64).

26. As per claim 21, Jagannathan teaches a method wherein information about an executing thread of the mobile agent is existed at the first host prior to being transferred to the third computing host (col. 6 lines 61-67; col. 10 lines 47-64; col. 9 lines 1-12).

27. As per claim 25, Jagannathan teaches a method wherein further comprising:

continuing monitoring for another indication to migrate the application(col. 3 lines 30-42,

col. 13 lines 44-56);

continuing migrating the application to other hosts(col. 12 lines 27-39).

28. Claim 26 is rejected based on the same rejection for claim 11 above. In addition

Jagannathan teaches means for transferring execution code from a central server to the

computing resources, the computing resources receiving and executing one of the small

tasks assigned to a mobile agent in the virtual machines using the execution code and the

means for transferring execution code maintaining stack trace and state information about

each of the mobile agents at a first alternate computing host where none of the mobile

agents are executing to allow each of the mobile agents to be reconstructed at a second

alternate computing host (col. 6 lines 61-67; col. 10 lines 47-64; col. 9 lines 1-12).

29. As per claim 28, Jagannathan teaches an apparatus wherein the central server comprises a

web server (col. 23 lines 25-57).

30. As per claim 29, Jagannathan teaches an apparatus further comprising means for

monitoring execution of the small tasks (col. 24 lines 40-60).

31. As per claim 30, Jagannathan teaches an apparatus further comprising collaboration

means for allowing the mobile agents to communicate and share information in real time

(col. 9 lines 32-41).

32. As per claim 31, Jagannathan teaches an apparatus wherein the mobile agents execute in

real time (col. 23 lines 25-57; col. 9 lines 32-41).

33. As per claim 32, Jagannathan teaches an apparatus further comprising storage means for

storing real time state information about the mobile agents as the mobile agents execute

at the computing resources (col. 9 lines 32-41; col. 6 lines 61-67; col. 10 lines 47-64; col.

9 lines 1-12).

34. As per claim 33, Jagannathan teaches an apparatus further comprising:

means for monitoring execution of the mobile agents at the computing hosts (col. 2 lines

59-67; col. 5 lines 57-67; col. 6 lines 1-19); and

means for detecting over-utilization of one of the computing hosts and for issuing a

warning when one of the computing hosts is over-utilized (col. 23 lines 25-57).

35. Claim 34 is rejected based on the same rejection for claim 1 and 16 above. In addition

Jagannathan teaches detecting an indication to migrate the mobile agent thread; and

in response to the indication, stopping execution of the mobile agent thread; and

transferring the information about the mobile agent thread to a second computing host

(col. 1 lines 9-15; col. 6 lines 33-45; col. 9 lines 1-11; col. 17 lines 1-14; col. 24 lines 22-

64).

36. As per claim 38, Jagannathan teaches a further comprising:

receiving the stack trace and state information about the mobile agent thread at the third

computing host(col. 18 lines 39-51); and

reconstructing the mobile agent thread at the third computing host using the stack and

state information about the mobile agent thread and continuing processing of the mobile

agent thread at the third computing host at a point at which execution of the thread was

stopped at the first computing host (col. 2 lines 59-67; col. 5 lines 57-67; col. 6 lines 1-

19).

37. As per claim 39, Jagannathan teaches a wherein the step of transferring the stack and

state information about the mobile agent thread farther comprises serializing the

information about the mobile agent thread (col. 2 lines 59-67; col. 5 lines 57-67; col. 6

lines 1-19; col. 1 lines 9-15; col. 6 lines 33-45; col. 9 lines 1-11).

38. Claim 40 is rejected based on the same rejection for claim 1 above. In addition

Jagannathan teaches agent collaboration environment, which comprises:

a plurality of mobile agents (col. 5 lines 57-67).

providing a virtual workspace for the mobile agents (col. 18 lines 39-51), and

a registration subsystem for selectively assigning the plurality of mobile agents

wherein each of the plurality of agents can share data, information(col. 9 lines 1-11; col.

17 lines 1-14; col. 24 lines 22-64).

39. As per claim 41, Jagannathan teaches an agent collaboration environment wherein the conference room monitors and moderates communication between the plurality of mobile agents (col. 18 lines 39-51; col. 2 lines 59-67; col. 5 lines 57-67).

40. Claim 42 is rejected based on the same rejected as claims 1 and 11 above.

41. Claim 43 is rejected based on the same rejected as claim 15 above.

42. Claim 44 is rejected based on the same rejected as claim 30 above.

43. Claim 45 is rejected based on the same rejected as claim 34 above.

44. Claim 46 is rejected based on the same rejected as claim 1 above.

45. Claims 47 and 48 are rejected based on the same rejected as claim 15 above.

46. Claims 49 and 50 are rejected based on the same rejected as claims 5 and 7 above.

47. As per claim 51, Jagannathan teaches an apparatus further comprising firewalls at the-said first and second organizations to allow execution code for said mobile agents to be exchanged between said first and second organizations (col. 2 lines 59-67; col. 5 lines 57-67; col. 6 lines 1-19).

48. As per claim 52, Jagannathan teaches method wherein the steps are carried out without the need to explicitly write add additional software code to either initiates manage, or facilitate the transfer of a mobile agent during said process of thread migration (col. 2 lines 59-67; col. 5 lines 57-67; col. 6 lines 1-19).

Conclusion

49. Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Nilesh Shah whose telephone number is (571)272-3771.

The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng An can be reached on (571)272-3756. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status information

for unpublished applications is available through Private PAIR only. For more information

about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access

to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197

(toll-free).

<div style="text-align:right">

Nilesh Shah
Examiner
Art Unit 2195

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NS
October 28, 2005

MENG-AL T. AN
PRIMARY PATENT EXAMINER
2100